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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,890	10/19/2004	Satoshi Koura	MAT-8601US	6479

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RATNERPRESTIA
P O BOX 980
VALLEY FORGE, PA 19482-0980

EXAMINER	
RU, POWEN	
ART UNIT	PAPER NUMBER
2615	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/511,890	KOURA ET AL.	
	Examiner	Art Unit	
	Powen Ru	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4 and 7-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2, 4, and 7-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This is the initial office action based on the application filed on 10/19/2004 and amended on 10/23/2006. Claims 1-2, 4, and 7-11 are currently pending and have been considered below.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 4, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Buhler et al. (6,924,584).

Claim 1: Buhler discloses a piezoelectric loudspeaker (piezoelectric transducer 1, col 3 line 31 – col 4 line 16 and col 6 line 28 – col 7 line 51, Fig. 3) comprising:

a diaphragm (chamber diaphragm 10, e.g., col 6 lines 41-46) having a first surface (upper surface 30) and a second surface (lower surface 28) opposite to the first surface (see Fig. 3),

the diaphragm having a first area (e.g., octagon in Fig. 10; the variation is applicable to Fig. 2 and the other embodiments, col 11 lines 61-65) and a second area (e.g., circle in Fig. 10) different from the first area;

a first piezoelectric material (e.g., octagonal element 14, col 12 lines 10-21, Fig. 10) provided on a portion of the first surface (Fig. 3) within the first area of the diaphragm (Fig. 10);

a second piezoelectric material (e.g., circular element 14, col 12 lines 10-21, Fig. 10) provided on a further portion of the first surface within the second area of the diaphragm (Fig. 3 in view of Fig. 10); and

a base (support structure 26, col 7 lines 16-28, Fig. 3 and Fig. 10) provided on the second surface of the diaphragm,

the base having a first opening and a second opening (the space defined by wall 34, Fig. 3 in view of Fig. 10) provided therein,

the first opening allowing a portion of the second surface within the first area to be exposed through the first opening (see Fig. 3),

the second opening allowing a further portion of the second surface within the second area to be exposed through the second opening (Fig. 3 in view of Fig. 10),

the first opening having a size different from a size of the second opening (e.g., col 12 lines 63-64, see Fig. 10).

Claim 2: Buhler discloses the piezoelectric loudspeaker as in Claim 1; and further discloses that the first and second piezoelectric materials include first and second piezoelectric thin films (i.e., element 14, col 1 lines 53-55 and col 6 lines 46-65, Fig. 3), respectively.

Claim 4: Buhler discloses the piezoelectric loudspeaker as in Claim 1; and further discloses that the first and second piezoelectric materials have sizes different from each other (e.g., col 12 lines 60-62, see Fig. 10).

Claim 8: Buhler discloses an electronic device (e.g., audio equipment, col 1 lines 27-28) comprising:

a piezoelectric loudspeaker (see the rejection regarding to Claim 1); and

a sound source (a charge to cause a speaker diaphragm to reproduce the sound, col 1 lines 22-33) connected to the piezoelectric loudspeaker (via electrical contact 24 and electrical contact layer 22, col 7 lines 27-28, Fig. 3).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada (3,892,624) in view of Buhler et al. (6,924,584).

Claim 7: Shimada discloses a loudspeaker system (e.g., speaker box 3, col 10 lines 35-39, Fig. 15) comprising a loudspeaker (woofer, 2W) having a sound reproduction frequency range lower than respective sound reproduction frequency ranges of the other speakers; but does not specifically teach that at least one of the

other speakers (two tweeters 2LT and 2RT, two squawkers 2LS and 2RS) is a piezoelectric loudspeaker.

However, Buhler discloses a piezoelectric loudspeaker (see the rejection regarding to Claim 1) suitable for audio equipment (col 1 lines 27-28). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to choose Buhler's piezoelectric loudspeaker as the tweeter for Shimada's loudspeaker system.

5. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buhler et al. (6,924,584) in view of Takahata (4,751,419).

Claim 9: Buhler discloses the piezoelectric loudspeaker as in Claim 1; and further discloses that the first and second piezoelectric materials have sizes different from each other (e.g., col 12 lines 60-62, see Fig. 10); but does not explicitly teach the corresponding sound reproduction frequency range.

However, Takahata teaches that varying the sizes of different piezoelectric oscillation devices accentuates certain frequency ranges in a selective manner to obtain various different appropriate frequency characteristics (col 5 line 64 – col 6 line 3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to conceive

that the second area of the diaphragm has a sound reproduction frequency range different from a sound reproduction frequency range of the first area of the diaphragm,

as the piezoelectric material on the second area has a size different from that of the first area.

Claim 11: Buhler discloses the electronic device as in Claim 8; see the preceding argument with respect to Claim 9.

6. Claims 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada (3,892,624) in view of Buhler et al. (6,924,584), and further in view of Takahata (4,751,419).

Claim 10: Shimada and Buhler teach the loudspeaker system as in Claim 7; and Buhler further discloses that the first and second piezoelectric materials have sizes different from each other (e.g., col 12 lines 60-62, see Fig. 10); but does not explicitly teach the corresponding sound reproduction frequency range.

However, Takahata teaches that varying the sizes of different piezoelectric oscillation devices accentuates certain frequency ranges in a selective manner to obtain various different appropriate frequency characteristics (col 5 line 64 – col 6 line 3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention to conceive

that the sound reproduction frequency range of the second area of the diaphragm is different from the sound reproduction frequency range of the first area of the diaphragm,

as the piezoelectric material on the second area has a size different from that of the first area.

Response to Arguments

7. Applicant's arguments with respect to Claim 1, 2 , 4, and 7-8 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment (e.g., adding a base in Claims 1 and 7-8) necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Powen Ru whose telephone number is 571-270-1050. The examiner can normally be reached on Monday-Friday 7:30am-4:00pm EST/EDT. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Sinh Tran can be reached on 571-272-7654. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SINH TRAN
SUPERVISORY PATENT EXAMINER

PR
1/8/2007